## Calculus Warm Up # 8-5

Find the arc length on [1, 2] of:

$f(x) = 4(x - 1)^2 + 3$

## Classwork:

**Calculus B Review # 2**

**Name:**_____

1. $\int \frac{2x-1}{x^2-x+4}dx =$

$\ln|x^2-x+4| + C$

2. $\int \frac{x}{(x^2+2)^2}dx =$

$\frac{-1}{2(x^2+2)} + C$

3. $\int \frac{e^x - e^{-x}}{e^x}dx =$

$x + \frac{e^{-2x}}{2} + C$

11

4. $\int \frac{x^2+x}{x-1}dx =$

$\frac{x^2}{2} + 2x + 2\ln|x-1| + C$

5. $\int_0^1 \left(x^2+1\right)^2 dx =$

$\frac{28}{15}$

6. Use a left Riemann sum with n = 4 equal subintervals to approximate $\int_0^2 \sqrt{x}dx$.

$A \approx 1.466$

7. Use the trapezoidal rule with n = 4 to approximate $\int_0^8 2x^3 dx$.

2176

8. Find the average value of $f(x) = 2x^2$ on [2, 4].

$\frac{56}{3}$

9. Find the work needed to stretch a spring 1 foot if it takes a force of 4 pounds to stretch the same spring nine inches from its natural length.

$\int_0^{12}$

$4 = k(9)$

32 in·lbs

10. Find the work needed to empty a right cone with a height 12 feet and a diameter of 4 feet, out the top. The base of the cone is on top and the cone is filled with water, density 62.4 lb/ft³.

$2995.2\pi$ ft·lbs

**11. Find the fluid force on a vertical circular object with radius 3 feet that is centered 12 feet below the water surface.**
**(Set up integral, then calculate.)**

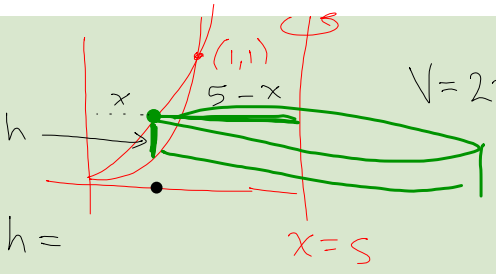
2117.82

**12. For the region enclosed by the functions $f(x) = x^2$ and $f(x) = x^3$**
**Set up the integral, then calculate the area.**

1/2

**13. Find the volume of the object obtained from the area in question 12 being rotated about the line x = 5.**

$\frac{11\pi}{15}$




$$V = 2\pi \int_0^1 (5-x)(x^2-x^3)\,dx$$

Turn in Classwork Week 8

Warm up on top

Pink Ch. 7 Review

Green Review #2

Time for Group Event!

# HW: Mixed Review #3

# salmon WS

(follows this slide)

Individual Quiz Tuesday:

7.2, 7.6, 7.7

Calculus Mixed Review #3 Name_____ Team_____

1. $\int \frac{4x+4}{x^2+2x-4}dx$

2. $\int \frac{x^2}{(x^3-1)^4}dx$

3. $\int \frac{1+e^{-x}}{e^{-x}}dx =$

4. $\int \frac{x^2+1}{x+1}dx =$

5. $\int_{-1}^{0}\left(x^3+1\right)^3 dx =$

6. Use a middle Riemann sum with n = 4 and equal subintervals to approximate

$\int_0^4 x^3 dx$

7. Use the trapezoidal rule with n = 4 to approximate.

$\int_0^1 \sqrt[3]{x}dx$

8. Find the average value of on [0, 4].

$f(x) = x^3$

9. Find the work needed to stretch a spring 2 feet if it takes a force of 6 pounds to stretch it 8 inches.

10. A right cylinder with height 12 feet and diameter 4 feet is half filled with water. Find the work needed to empty it out the top.

11. Find the fluid force on a vertical square object with sides of 3 feet that is centered 4 feet below the water surface.

12. Sketch the graph and find the area between the functions on [0, 4].

$f(x) = \sqrt{x}$ $\quad$ $f(x) = x$

13. Rotate the region from question 12 on [0,1] about the given line and find the volume of the solid created.

a) about y = 5 $\quad$ b) about the y-axis